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TAMAI, KARL I	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/083,927
Filing Date: February 27, 2002
Appellants: KALSI ET AL.

Ido Rabinovitch
L0080

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 7, 2006 appealing from the Office action mailed 7/20/2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

US Patent No.	Inventor	Publication Date
4,356,419	Boer et al.	10/26/1982
4,330,726	Albright et al.	05/18/1982
4,709,180	Denk	11/24/1987
4,385,248	Laskaris	05/24/1983
5,863,467	Mariner et al.	01/26/1999
4,123,676	Cooper et al.	10/31/1978
5,777,420	Gamble et al.	07/07/1998

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

1. Claim 1, 2, 5, 30, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419) and Albright et al. (Albright)(US 4,330,726). Boer teaches a stator assembly 1,2 forming an axial passage with thermally conductive, non-magnetic teeth forming channels for coils 3,4,5 and forming a passage for the rotor. Boer teaches the coil support (teeth) being non-magnetic and thermally conductive but not the entire coil support being non-magnetic and thermally conductive material, or a ground plane assembly. Albright teaches the entire coils support being non-magnetic. Albright teaches a fiberglass tie to provide grounding protection (col. 6, lines 14-20). It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the machine of Boer with the non-

magnetic coil support section 2 entirely supporting the coil as in Albright to properly support and coil the motor, and with the coils having ground armor to short the coil armor to ground.

2. Claims 3, 4, 31, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419) and Albright et al. (Albright)(US 4,330,726), in further view of Denk (US 4,709,180). Boer and Albright teach every aspect of the invention except axial cooling passages for the circulation of a cooling liquid. Denk a cooling liquid circulated through the axial cooling passages of the magnetic core 90. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer and Albright with the fluid cooling of Denk to remove heat from the stator.

3. Claims 7, 8, 35, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419) and Albright et al. (Albright)(US 4,330,726), in further view of Laskaris (US 4,385,248). Boer and Albright teach every aspect of the invention except, the wedge material 2 being graphite based and the epoxy filler between the coil assembly and the coil support. Boer teaches the wedges are epoxy-graphite. Boer teaches the coils are epoxy impregnated, which would inherently include epoxy between the coils and the support. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer and Albright with the wedges being epoxy graphite because Boer teaches the

composite material is a good choice for the wedge, and with the epoxy filler between the coils and the support to reduce losses between the winding and the support.

4. Claims 6 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419), Albright et al. (Albright)(US 4,330,726), and Laskaris (US 4,385,248), in further view of Mariner et al. (Mariner)(US 5,863,467). Boer, Albright, and Laskaris teach every aspect of the invention except, the epoxy being a polymer. Mariner teaches a polymer graphite material which has good thermal conductivity. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer, Albright, and Laskaris with the epoxy being a polymer because Mariner teaches the polymer graphite material has good thermal conductivity.

5. Claims 9, 10, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419) and Albright et al. (Albright)(US 4,330,726), in further view of Cooper et al. (Cooper)(US 4,123,676). Boer and Albright teach every aspect of the invention except a superconducting rotor. Cooper teaches a refrigerated, superconducting rotor. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer and Albright with the rotor of Cooper to provide a low loss field rotor.

6. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419), Albright et al. (Albright)(US 4,330,726), and Cooper et al. (Cooper)(US 4,123,676), in further view of Denk (US 4,709,180). Boer, Albright, and Cooper teach every aspect of the invention except axial cooling passages for the circulation of a cooling liquid. Denk a cooling liquid circulated through the axial cooling passages of the magnetic core 90. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer, Albright, and Cooper with the fluid cooling of Denk to remove heat from the stator.

7. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419), Albright et al. (Albright)(US 4,330,726), and Cooper et al. (Cooper)(US 4,123,676), in further view of Laskaris (US 4,385,248). Boer, Albright, and Cooper teach every aspect of the invention except, the wedge material 2 being graphite based and the epoxy filler between the coil assembly and the coil support. Boer teaches the wedges are epoxy-graphite. Boer teaches the coils are epoxy impregnated, which would inherently include epoxy between the coils and the support. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer, Albright, and Cooper with the wedges being epoxy graphite because Boer teaches the composite material is a good choice for the wedge, and with the epoxy filler between the coils and the support to reduce losses between the winding and the support.

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer)(US 4356419), Albright et al. (Albright)(US 4,330,726), Cooper et al. (Cooper)(US 4,123,676), and Laskaris (US 4,385,248), in further view of Mariner et al. (Mariner)(US 5,863,467). Boer, Albright, Cooper, and Laskaris teach every aspect of the invention except, the epoxy being a polymer. Mariner teaches a polymer graphite material which has good thermal conductivity. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer, Albright, Cooper, and Laskaris with the epoxy being a polymer because Mariner teaches the polymer graphite material has good thermal conductivity.

9. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boer et al. (Boer), Albright et al. (Albright), and Cooper et al. (Cooper), in further view of Gamble et al. (Gamble) (US 5,777,420). Boer, Albright, and Cooper teach every aspect of the invention except, the superconductive material being HTS material. Gamble teaches a HTS material for the rotor windings. It would have been obvious to a person of ordinary skill in the art at the time of the invention to construct the stator of Boer, Albright, and Cooper with the HTS rotor windings because Gamble teaches that the material is preferred in superconductive rotors.

(10) Response to Argument

Claim 1 – Prior Art Fails to Teach Claimed Limitations

Appellant's argument that Boer and Albright do not teach a stator coil support structure, where substantially the entire coil support structure is constructed of a non-magnetic thermally conductive material is not persuasive. The Appellant cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).
Boer teaches a stator assembly 1 (or 201) is formed of magnetic material such as high silicon steel (page 4, line 28). The coils support structure 2 (202) is formed of non-magnetic austenetic sheet (col. 4, line 31) welded to the magnetic core section (1 or 201). Austenite is a non-magnetic steel, which is inherently thermally conductive, therefore the support is non-magnetic and thermally conductive. Boer teaches the stator coil support (teeth 2 or 202) being non-magnetic and thermally conductive but not the entire coil support being non-magnetic and thermally conductive material because the radial outer portion of the coils 3, 4, 5 are supported by the magnetic core (1 or 201). Albright shows a two-part core where the outer portion 12 is magnetic (silicon steel col. 4, line 28) and inner coil support portion 14 is fiber glass impregnated with epoxy resin (col. 4, line29). The coil support entirely supports the coils 36 circumferentially and radially. The stator support structure 12 is non-metallic to support the coils against vibration and radial forces (col. 1, line 59) caused by the large magnetic forces in superconductive machines (col. 1, line 55). The combined teaching of Boer and Albright teaches the non-magnetic and thermally conductive coil support of

Boer entirely supporting the coils to help prevent vibration caused by the large magnetic forces in a superconductive machine.

Appellant's argument that Albright teaches the inner lamination being thermally non-conductive fiberglass is not persuasive. Appellant cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. (See *In re Keller*, supra). Boer teaches the inner coils support being a non-magnetic and thermally conductive metal. Albright is relied upon for the teaching the claimed limitation of the stator coil support structure substantially entirely supporting the coils, which is the limitation that the Appellant added to the claims to overcome the Boer as a 35 USC 102b reference (see amendment dated 5/16/2005). It would have been obvious to extend the non-magnetic, thermally conductive teeth of Boer substantially entirely support the coils in the stator assembly to prevent the vibration caused by the large magnetic forces generated in the superconductive machines as taught by Albright (col. 1, lines 55-60) and the stator structure provides easy assembly and it is capable of withstanding the large magnetic forces of a superconductive machine (col. 3, lines 56-64).

Appellant's argument that the claims limitations of Claim 1 are not taught by Boer and Albright is not persuasive for the reasons set forth above. The rejection is proper and should be maintained.

Claim 1 – Hindsight

Appellant's argument that the combination of Boer and Albright is hindsight reconstruction is not persuasive. The examiner recognizes that any judgment on

obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In the instant application, Albright literally teaches the non-magnetic coil support 14 that substantially entirely supports the coils help prevent the vibration caused by the large magnetic forces generated in the superconductive machines as taught by Albright (col. 1, lines 55-60) and the stator structure provides easy assembly and it is capable of withstanding the large magnetic forces of a superconductive machine (col. 3, lines 56-64). The non-magnetic coil support includes slots which substantially entirely hold the coils against the large magnetic forces (col. 6, line 37-41). The non-magnetic coil support 14 includes slots and coil supports which are employed to permit pretension of the glass ties holding the coils in the slots to prevent excessive vibration under normal operating loads and which can be retightened accommodate relaxation or compression creep of stator coil support (col. 6, line 57-61). The motivation to provide the non-magnetic coil support to substantially support the entire coil comes directly and literally from Albright, and as such is not hindsight reconstruction.

Claim 1 – No motivation to combine Boer and Albright

Appellant's argument that there is no motivation to combine Boer and Albright is not persuasive for the reasons set forth above. Albright provides literal motivation to provide an inner non-magnetic coil support that substantially entirely supports the coil to

counter the vibrations caused by magnetic forces in superconductive machine (col. 1, line 55-60, col. 3, line 56-64), and because the non-magnetic support provides a slot structure to prevent excessive vibrations caused by the large magnetic forces (col. 6, lines 37-61). Appellant's argument that Albright cannot be combined with Boer because Boer requires a magnetic shield zone and a non-magnetic shield zone is not persuasive. Albright teaches both a magnetic shield zone 12 and a non-magnetic shielding zone 14, particularly the non-magnetic zone reduces the vibrations caused by using iron (magnetic teeth) to support coils (col. 1, line 57). Boer and Albright are both directed to the problems associated with the large magnetic fields created by superconductive machine. Boer and Albright both provide the same outer magnetic supporting and an inner non-magnetic coil support to counter the large magnetic forces. Boer motivates the inner shield being non-magnetic, thermally conductive material because it teaches the preferred non-magnetic material is austenitic X10CrNiTi89, which is a non-magnetic, thermally conductive steel, because the non-magnetic metal can be welded with the magnetic steel to provide a lamination with the strength of a homogeneous sheet (col. 4, line 52). The inclusion of the non-magnetic coil support "substantially entirely" supporting the coil support is motivated to reduce vibrations cause by the large magnetic forces in the coil (col. 1, lines 55-60), the stator structure provides easy assembly and it is capable of withstanding the large magnetic forces of a superconductive machine (col. 3, lines 56-64), and slot structure is capable of holding the coils against the large magnetic forces (col. 6, line 40). The Appellant's argument regarding motivation is not persuasive because it is literally provided by Albright, and

because the combine teachings of Boer and Albright disclose all the features of the Appellant's claimed invention.

Appellant's argument that Claim 9 is allowable for the same reasons as Claim 1 is not persuasive because Claim 1 is rejected over Boer and Albright as discussed above.

Claim 7, 15, and 35 – Stand or Fall together

Appellant's argument that claim 7 is allowable because they have a different reason (non-magnetic and thermally conductive) to use a graphite based material is not persuasive. The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In the instant Application Laskaris teaches that the core (poles 19) and wedges 22 can be made of a graphite material to prevent the sliding of the coils in a superconducting machine (col. 6, lines 14-26). The intended features of being non-magnetic and thermally conductive are inherent features of the selection of the poles and wedges being graphite epoxy, which is a taught by Laskaris as being good to prevent movement of the coils in the coil support. Additionally, it has been held that the selection of materials based on intended use requires only routine skill in the art (see *In re Leshin*, 125 USPQ 416). Appellant's argument that Laskaris is not a stator coil support structure is not persuasive because the title and specification particularly teach a support for windings in a superconductive machine. Appellant's argument that Boer and Albright do not suggest the use of epoxy

is not persuasive because Albright teaches the inner non-magnetic section 14 being an epoxy resin. Therefore, the rejection is proper because Laskaris provides proper motivation for the selection of the epoxy resin and graphite to prevent the coil from sliding, and mere selection of the material is held as an obvious choice to a person of ordinary skill in the art by caselaw. The rejection is proper and should be maintained.

Claim 8, 16, and 36 – Stand or Fall together

Appellant's argument that Boer does not teach epoxy filler between the stator coils and the support structure is persuasive. All of the references include insulating filler between the coils and the support. Boer teaches an insulation 6 between the support structure and the coils, but not necessary an epoxy filler. Albright teaches the slots support the coils through an inert liner of carbon filled epoxy 32 to hold the coils in the slots (col. 4, lines 54-60). Laskaris teaches the coils are held together by epoxy (col. 3, line 59), therefore there inherently is epoxy filler between the coils and the coil support. Laskaris additionally teaches the coils are secured against movement to the stator support structure by a suitable insulating material 15, particularly leather, cellulose paper, polyethylene paper and the like material. The rejection is proper because the combined teaching of the Boer, Albright, and Laskaris all teach an insulating filler between the coils and the stator support, with Albright and Laskaris specifically teach the use of epoxy to support the coil in the slot, and additionally affirmed by caselaw in that it has been held that the selection of materials based on intended use requires only routine skill in the art (see *In re Leshin*, 125 USPQ 416). The rejection is proper and should be maintained.

(11) Related Proceedings Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

KARL TAMAI
PRIMARY EXAMINER

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Conference Date: 06/05/2006

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